REDESCRIPTION OF THE ORIENTAL AND AUSTRALIAN SPECIES OF THE GENUS *METANIA* GRAY, 1867 (PORIFERA: METANIIDAE)

Cecilia Volkmer-Ribeiro[1]
Paula Regina Chaffe Costa [2]

ABSTRACT

Metania vesparium (Martens, 1868) and *Metania vesparioides* (Annandale, 1908), from the Oriental Region and *Metania ovogemata* Stanisic, 1979, from the Australian Region, are redescribed and have their specific status confirmed in the genus *Metania* Gray, 1867 "sensu" Volkmer-Ribeiro, 1986 (Porifera; Poecilosclerida; Metaniidae). Lectotypes and paralectotypes are selected for *M. vesparium* and *M. vesparioides*. New features are described for the three species based on SEM studies of spicules and compared to those of the Neotropical species. A key is presented for the three species.

KEYWORDS. Freshwater sponges, *Metania*, Metaniidae, Porifera.

INTRODUCTION

VOLKMER-RIBEIRO (1986) revised the Neotropical species of *Metania* Gray, 1867 and presented a redefinition of the genus. At the same time the family Metaniidae was erected for the freshwater sponges of the genera *Metania, Acalle* Gray, 1867, *Drulia* Gray, 1867 and *Corvomeyenia* Weltner, 1913. *Acalle* and *Drulia* are exclusively Neotropical. VOLKMER RIBEIRO (in press), redefined genus *Corvomeyenia* and extended its occurrence from the Neartic to Neotropical Region. *Metania* is the only genus in the family to show a Gondwanic type of distribution, with species recorded from the Neotropical, Ethiopian, Australian and Oriental Regions. Recently VOLKMER-RIBEIRO & COSTA (1992) described the fifth Neotropical species of the genus. The revision of the genus follows with the redescription of the two Oriental and the only Australian species.

1. Museu de Ciências Naturais, Fundação Zoobotânica do Rio Grande do Sul, C.P. 1188, 90001-970, Porto Alegre, RS, Brasil.
2. Curso de Pós-Graduação em Biociências, área de Zoologia, Pontifícia Universidade Católica do Rio Grande do Sul, C.P. 1429,90619-900, Porto Alegre, RS, Brasil.

Abbreviations used: ZMB, Zoologisches Museum der Humboldt Universität, Berlin; BMNH, The Natural History Museum, London; USNM: United States National Museum, Washington; ANSP, Academy of Natural Sciences of Philadelphia; AUSM: Australian Museum, Sydney; MCN: Museu de Ciências Naturais, Fundação Zoobotânica do Rio Grande do Sul, Porto Alegre.

Metania vesparium (Martens, 1868)

(Figs. 1-10,41)

Spongilla vesparium MARTENS, 1868: 61, pl. 1, fig. 1.
Tubella vesparium; WELTNER, 1895: 129; ANNANDALE, 1911: 54; 1918: 213; GEE, 1929: 297; 1930:105; 1932: 44; 1933:248; PENNEY, 1960: 59.
Metania vesparia; PENNEY & RACEK, 1968: 148, pl. 14, figs. 5-7 (**partim**).

Lectotype: Part in ZMB, nº 248, (fig. 1), part in ANSP (fig. 5), part in USNM, nº 21251 (fig. 4), Dr. Hunius leg., River Kapuas, Sintang, Borneo.

Paralectotypes: ZMB nºs. 12602, 12603, Dr. Hunius leg, River Kapuas, Sintang, Borneo (figs. 2, 3).

Type locality: River Kapuas at Sintang, Borneo.

Comments on the lectotype selection: The syntypic series deposited in the ZMB has two entire specimens (figs. 2, 3) and a piece left of another one (fig. 1). None of the two entire specimens or their respective supports correspond to the specimen incrusting a forked twig and illustrated by MARTENS (1863: fig. 1). The authors are convinced that the piece of sponge (fig. 1.) is part of that specimen as are other pieces deposited at the Potts Collection (ANSP), the Gee Collection (USNM) and probably also the Annandale Collection at the Indian Museum, Calcutta, India. The senior author found among the sponges in the Potts Collection (ANSP), a piece of sponge labelled as "*Tubella vesparium* Mart. Sintang, (Borneo)" (fig. 5). That piece was examined and corresponds in size and shape to the bottom third of the specimen figured by MARTENS (1863: fig. 1). ANNANDALE (1911:121) states that by "the kindness of Dr. Weltner" he could study type material of *T. vesparium*. Thus another piece must have been taken out of the specimen which, at the time, missed already its bottom third. GEE (1930: 106) registers that he received from Dr. Arndt a small piece of *S. vesparium* (USNM nº 21521). A photograph of that piece (fig. 4) shows it to conform to the upper third of the specimen illustrated by von Martens. The lectotype was selected upon study of its largest piece, deposited in the Potts collectìons which was seen to conform to the characteristics in the original description.

The species name amended by PENNEY & RACEK (1968) from *vesparium* to *vesparia* is incorrect because the word "vesparium" is a noun, correctly spelled in the original combination.

Material examined: Part of the lectotype, ANSP, Dr. Hunius leg. River Kapuas, Sintang, Borneo.

Redescription: Sponges forming fusiform, bulbous or cordiform, strongly reticulate crusts (figs. 1-5), on the branches and twigs of the seasonally flooded riparian vegetation. The skeleton consists of an open reticulum of stout, spaced, radial main fibers which

pierce the sponge surface as conical or bifurcated stout projections (fig. 5). Secondary slimmer fibers extend at large intervals among the main fibers, composing a reticulum of eliptical to rounded meshes which are progressively larger towards the sponge surface. Oscula conspicuous as larger orifices in the reticulum. Dry sponges yellowish to grayish brown. Consistency very hard.

Megascleres forming two distinct classes: (1) alfa megascleres: stout, smooth, straight to curved anfistrongyla, sometimes presenting inflated extremities (figs. 6, 8, 41). the alfa megascleres make up the skeletal fibers as well as the capsules around the gemmules; (2) beta megascleres: extremely rare in the examined material; slim, straight to curved anfistrongyla with sparse, bumped proeminences instead of spines (figs. 5, 6, 41). The position of the beta megascleres in the sponge skeleton could not be detected.

Microscleres: Very slim, slightly curved, sparsely spined microxea with gradually, very sharp, harpoon shaped extremities. The middle two fourths of the spicule are covered with larger, spaced, conic spines with lanceolated endings (figs. 7, 13, 41).

Gemmoscleres: Boletiform spicules with straight, spiny, short to long shafts. Collar of spines under the lower rotule usually conspicuous with large, irregularly placed spines or one spine developed into a lateral expansion. Lower rotule (figs. 9-12) large, flat or slightly umbonate, undulated, its inner face with a few discrete radial expansions of the shaft which meet the border as straight or incurved spines, marking off its polygonal profile, Borders of the lower rotule thin and incurved. Upper rotule (figs, 11, 41) comparatively large, well formed, flat to slightly umbonate, bearing at its border a regular number of blunt or bifid large incurved hooks. Also upper rotule knobed and showing a few blunt spines.

Gemmules: Abundant, spherical, small, distributed from the base to the top of the sponge and protected by a loose packing of the alfa megascleres which may develop into capsules around the gemmules. Foraminal tube short, straight with slanting gemmoscleres and a thick, undulated border. Gemmoscleres radially arranged in one single layer their lower rotules overlapping in the inner coat. The smaller gemmoscleres are concealed inside the pneumatic coat. The larger ones project with part of the shaft and the upper rotule beyond the pneumatic coat.

Dimensions of the spicules and gemmules (Tables I, II).

Habitat: The preferred substrate are the branches and twigs of a seasonally flooded Myrtaceae refereded by von Martens to genus *Barringtonia*.

Distribution: River Kapaus and Lake Danau Sriang, Sintang, Borneo. MARTENS (1868:63) remarks that he had not seen this sponge in wet conditions before he visited Lake Danau Sriang, on May, 1863. The original description covers the shape of the specimes in the syntypic series and yet other ones, suggesting that Martens used also his personal observations of specimes at Lake Danau Sriang.

Metania vesparioides (Annandale, 1908)

(Figs. 14-24,40)

Tubella vesparioides ANNANDALE, 1908: 157-58; 1911: 64, 120-122, fig. 25, pl. II, fig. 4; 1918: 213; GEE, 1931: 52; 1932:44; 1933: 249; PENNEY, 1960:59.

Metania vesparoides; PENNEY & RACEK, 1968: 151, pl. 14, figs. 13-15; SOOTA, 1992:93

Lectotype: BMNH nº 1914: 11: 24: 36, N. Annandale leg. March, 1908, edge of the Kanghy (great pond) at Mudon, Amherst District, Tenasserim, Burma (fig. 14).

Paralectotypes: BMNH nº 1908: 2: 11: 4; also three pieces of crusts, Indian Museum, Calcutta, N. Annandale leg. March, 1908, edge of the Kanghy, at Mudon, Amherst District, Tenasserim, Burma (fig. 14).

Type locality: Kanghy (great pond), at Mudon, Amhearst District, Tenasserim, Burma.

Comments on lectotype selection: ANNANDALE (1911) produced a redescrioption of *Tubella vesparioides* where he stated that the type was deposited in the Indian Museum, Calcutta. At the same time he presented a photograph of part of the reticulate skeleton of that mentioned type. However in the original description of *T. vesparioides* he did not designate a type out of (1911:122) "the specimens" he collected in his only visit to the Kanghy at Mudon. Two specimens of this syntypic series were lately exchanged with the British Museum. The senior author recently addressed Dr. B. P. Haldar, The Zoological Survey of India, Calcutta for localization of type material of *T. vesparioides* and was informed that only the thin crust photographed by Annandale and two smaller fragments remain in the Museum. The lectotype selected is a full grown sponge which throughly evinces the "wasp nest" shape as well as the other originally or presently described characteristis which come to confirm the specific status of *Metania vesparioides*.

Material examined: fragment and gemmules of the lectotype and of the paralectotype in the BMNH.

Redescription: Sponges growing from shallow to thick crusts on logs and on branches of periodically submerged vegetation. Also sponges forming fusiform or bulbous masses around the branches and twigs and then taking on the "vesparium" - like shape. Surface conspicuously reticulate, hispid and sculptured into shallow to deep furrows. Oscula conspicuous as larger, rounded orifices in the reticulum. Skeleton differing from the base to the top of the sponge. Basal skeleton composed of slim and sparse spicular fibers where no main fibers can be perceived forming a reticulum of very open meshes filled with masses of small gemmules. Towards the sponge surface the skeleton grades into an stouter, more closed reticulum of main thick fibers and secondary slimmer fibers with a reduced number of gemmules. The main fibers project their bi or trifurcate extremities at the sponge surface. Dry specimens brownish-black, hard but brittle.

Megascleres forming two distinct classes: Alfa megascleres: smooth, long, slim, straight to slightly curved oxeas with extremities abruptly sharp pointed, some rare styles also present (figs. 15, 17, 40). The alfa megascleres integrate the skeletal fibers and build the capsules around the gemmules. Fibers with scanty spongin solding the spicules together.

Beta megascleres: Rare, short to long, extremely slim, straight to slightly curved, spined oxea with abruptly pointed to lanceolated extremities; spines small, acute, densely or sparsely distributed along the spicule, except at the extremities which are smooth, a whorl of spines may group at the base of the extremities (figs. 16, 40). The position of the rare beta megascleres in the sponge skeleton could not be detected.

Microscleres: Extremely slim, straight to slightly curved, spined microxea with the extremities gradually very sharply harpoon ended, the middle third of the microscleres

have some long, stout, sparse, conic spines turned into opposing directions; such larger spines have lanceolate endings which at the SEM analysis are seen to be capped by a whorl of incurved spines (figs. 17, 21, 23, 40).

Gemmoscleres: Long, slim, uniformely sized boletiform spicules with straight, heavily spined shafts displaying a conspicuous enlargement from the collar of spines down to the inner face of the lower rotule. Shaft spines short, straight, acute. Lower rotule small, flat or slightly undulated, its inner face having several stout, radial reinforcements of the shaft which extend up to the border of the rotule, marking off its indented profile; margins of the lower rotule thick and cut into flat or incurved teeth; upper rotule usually knobbed, small, smooth or bearing a few strongly incurved spines or hooks; also upper rotule larger, umbonate or flat and having at its border six large incurved or bent hooks which are seen at the SEM analysis to end in small claws or burls (figs. 15, 17-20, 22, 24, 40).

Gemmules: Extremely abundant, spherical or hemispherical, small, scattered throughout the basal reticulum and solded to the skeletal fibers or to each other by a varying amount of alfa megascleres and scanty spongin; also some gemmules singly incased in capsules with reticulate walls of alfa megascleres. Foraminal tube short, projecting beyond the pneumatic coat, nude, larger at the top and having an undulated collar in its middle reach. Gemmoscleres radially embedded in one single layer in the pneumatic coat, with their lower rotules overlapping at the inner coat and some of the upper rotules projecting beyond the pneumatic coat.

Dimensions of the spicules and gemmules are presented in Tables I and II.

Habitat: Incrusting logs and branches or twigs seasonally submerged at the margins of a great pond.

Distribution: Known only from the type locality.

Metania ovogemata Stanisic, 1979

(Figs. 25-39)

Metania ovogemata STANISIC, 1979: 24, fig. I.

Type locality: Freshwater billabongs near Maningrida, Arnhem Land, Northern Territory, 12°00'S, 134°20'E, Australia.

Material examined: Holotype, AMZ nº 3693, freshwater "billabong" near Maningrida, Arnhem Land, Northern Territory, Australia, Mr. Graeme Wells leg. 6.X.1976. (figs. 25, 26).

Redescription: Sponges forming thick crusts with furrows and ridges on the bark of log (fig. 25). The oldest and thicker parts of the crust are grayish-black and have a reticulate surface. The younger, thinner parts of the crusts have an yellowish tan, felted surface and are full of gemmules (figs. 25, 26). The crusts have a harder consistency at the darker portions which also exhibit a conspicuous ectosome. . Oscula inconspicuous at the naked eye. Under magnification it is possible to see the darker parts underlined by the lighter ones which are thus the first to form. Each of these two tiers has a different skeletal structure. The basal yellowish layer has an extraordinary number of large, ovoid gemmules, randomly grouped and with the foraminal appertures usually turned sidewards. The space among the gemmules is filled with beta megascleres and microscleres

randomly mixed up and with no detectable spongin among them. There is no trace of fibers in this basal layer. When the basal layer is several gemmules thick a second layer starts to form with very short, thin and spaced spicule fibers composing a reticulate skeleton of small circular meshes where no secondary fibers are distinguished and where the alfa megascleres predominate and the spongin is scarce. Some of the fibers pierce the quite conspicuous ectosome. Ectosome with abundant microscleres. Small circular oscula or larger oscular areas with irregular profiles are seen under magnification. Spicule fibers a few spicules thick. Consistency of dry sponge fragile and brittle.

Megascleres forming two distinct classes: (1) Alfa megascleres: Long, slim, smooth, from straight to slightly curved oxea with extremities gradually pointed (figs. 27, 39). The alfa megascleres build up the reticulate skeleton. (2) Beta megascleres: Abundant, stout, long, from straight to curved and from heavily to sparsely spined, extremities abruptly pointed, a circle of larger spines marks off the base of the conical extremities. The beta megascleres (figs. 28, 39) exhibit a large variation in size, shape and spine covering, sometimes approaching an acantostyle other times an acantostrongyle. The beta megascleres fill the spaces among the gemmules at the basal part of the sponge and pack in loose capsules around them. These megascleres are rarely found in the upper, reticulated part of the skeleton.

Microscleres: Abundant, large, profusely and characteristically spined, from straight to slightly curved oxea with blunt, harpoon shaped extremities. The middle portion of the microscleres has a few digitiform projections capped by crowns of microspines. The same arrangement of microspines is seen along the microscleres (figs. 29-31, 39).

Gemmoscleres: Short, boletiform, quite uniformely sized spicules; the collar of spines, if present, reduced to only one or two spines. Shaft sparsely spined, rarely smooth, with a marked constriction under the upper rotule, spines short, conic, sharp pointed, quite often enlargened as lateral expansions of the shaft (figs. 32-37, 39). Lower rotule large, flat or slightly umbonate, with a polygonal to rounded profile, the inner face of this rotule with only one or two residual expansions of the shaft (figs, 34, 36, 38). Border of the lower rotule poorly developed, thin, incurved and with a residual indentation or rotule almost entire. Upper rotule knobbed, smooth or provided with a few spines or upper rotule with star-like profile (figs. 32-37,39).

Gemmules: Abundant, ovoid, randomly grouped from the base to the middle reach of the sponge crusts, free, with the beta megascleres packing around them or inside loose individual capsules of beta megascleres. Foraminal tube short, conic, nude, usually contained inside the thick pneumatic coat, gemmules set with the foraminal tubes lateraly turned. Pneumatic coat thick, the gemmoscleres radially embedded in it in one single layer, with their lower rotules overlapping in the inner coat and the shaft and upper rotules embedded in the pneumatic coat.

Dimensions of the spicules and gemmules are presented in Tables I and II

Habitat: incrusting logs in shallow water of ox-bow lakes ("billabongs").

Distribution: known from the type locality.

DISCUSSION

The SEM analysis of the spicules and the renewed study of the skeletal and gemmular struture in *M. vesparium, M. vesparioides* and *M. ovogemata* disclosed a

boletiform gemmosclere provided with a collar of spines under the lower rotule; two classes of megascleres, one smooth an the other spiny (the beta megascleres), microscleres with harpoon ended extremities and larger peculiar spines in their middle part; an usually stout, reticulate skeleton with scanty spongin in the polispicular fibers; gemmules singly held in capsules and a same disposition of the gemmoscleres in the gemmular wall. The three species conform thus to the generic redefinition proposed by VOLKMER-RIBEIRO (1986) for genus *Metania*.

The present redescriptions come to enlarge those presented by PENNEY & RACEK (1968) for *M.vesparium* and *M. vesparioides* and the original description of *M. ovogemata* by STANISIC (1979). The skeleton in *M. vesparium* is now seen to have larger meshes towards the sponge surface, in *M. vesparioides* smaller meshes are formed close to the surface whilst in *M. ovogemata* a uniformly reticulate skeleton is produced from the middle of the sponge to its surface, a random pilling of gemmules surrounded by beta megascleres composing the basal part. In *M. vesparium* the gemmules are singly protected by a packing of alfa megascleres which may form capsules and are distributed from the base to the top of the sponge, in *M. vesparioides* they are singly held inside conspicuously reticulated capsules of alfa megascleres and get rarer towards the surface of the sponge, in *M. ovogemata* the gemmules form basal layers surrounded by beta megascleres. This study also demonstrates features of the gemmoscleres which clearly indicate specific variatons produced in the lower and upper rotules, in the inner face of the lower rotule, in the shape and distribution of spines on the shaft and in the collar of spines under the lower rotule; also very clear specific distinctions are demonstrated for the extremities of the microscleres and their spine and microspine covering as well as for the shape and spine covering of the beta megascleres.

The authors consider that the modification in the state of the upper refered characters is of the same order as that observed by VOLKMER-RIBEIRO & COSTA (1992) for the Neotropical species of *Metania*, and confirm thus the specific status of *M.vesparium, M. vesparioides* and *M. ovogemata*. The specific distinction allied to the geographical discontinuity in the range of the three species support now the exclusion of any consideration of the synonymization of *M. vesparioides* in *M. vesparium* as suggested by PENNEY & RACEK (1968). The authors also do not endorse the synonymization of the ethiopian species of *Metania* in *M. vesparium* as proposed by PENNEY & RACEK (1968). A renewed study of those species has to be carried out now on the same grounds as done for the Neotropical (VOLKMER-RIBEIRO & COSTA, 1992) and for the Oriental and Australian species.

Metania subtilis Volkmer-Ribeiro, 1979, from the Neotropical Region, appears as the only species in the genus to have completely lost the beta megascleres and *M. kiliani* Volkmer-Ribeiro & Costa, 1992, also from the Neotropical Region, as the only one to possess two classes of microscleres: one of spiny oxea and the other of the chaela-type.

VOLKMER-RIBEIRO (1981, 1986) registered the remarkable preference of sponges of the genus *Metania* to incrust substrates placed in the water/air interface of the periodically flooded habitats of the Tropical Rain Forest realms. The specimens of *M. vesparium, M. vesparioides* and *M. ovogemata* were all collected in dry condition incrusting branches, twigs or logs which had been earlier submersed. The characteristic habitat of sponges of this genus is now again stressed.

Key to the Oriental and Australian species of the genus *Metania* Gray, 1867 (Sponges with boletiform gemmoscleres which have a spiny shaft and a collar of spines under the lower rotule **sensu** VOLKMER-RIBEIRO, 1986: 497).

1. Sponges with a conspicuously reticulate skeleton, rare beta megascleres and slim, gradually sharply pointed, sparsely spined microscleres bearing some larger, lanceolated spines at middle part.....2
   Sponges with a superficially slightly reticulate skeleton , abundant heavily spined stout beta megascleres, blunt, harpoon ended heavily spined microscleres bearing at middle part a few degitiform projections covered, as well as the whole spicule by crowns of microspines.....*M. ovogemata*
2. Sponges with slim, heavily spined gemmosclere shaft with a conspicuous enlargement from the region of the collor to the base of the lower rotule, lower rotule with indented profile and strong radial expansions of the shaft on its inner face.....*M. vesparioides*
   Sponges with a stout, sparsely spined gemmosclere shaft, with the collar of spines under the lower rotule reduced to one or two spines or absent, lower rotule slightly polygonal in profile, its inner face with a few shallow residual radial expansions of the shaft.....*M. vesparium*

Table I. Sizes, in micrometers of megascleres and microscleres of *Metania vesparium* (Martens, 1868), *M. vesparioides* (Annandale, 1908) and *M. ovogemata* Stanisic, 1979.

	Alfa megascleres		Beta megascleres		Microscleres	
	Lenght	Width	Lenght	Width	Lenght	Width
M. vesparium	126-280	10-25	148-193	11-14	78-120	3-6
M. vesparioides	252-396	11-22	126-264	5-12	78-125	2-5
M. ovogemata	266-387	12-25	185-389	12-25	95-135	3-6

Table II. Sizes, in micrometers of gemmoscleres and gemmules of *Metania vesparium* (Martens, 1868), *M. vesparioides* (Annandale, 1908) and *M. ovogemata* Stanisic, 1979.

	Gemmoscleres				Gemmules
	Lenght	Width	Lower rotule	Upper rotule	
M. vesparium	38-59	4-7	23-29	8-15	463-585
M. vesparioides	49-78	4-6	19-29	6-13	453-662
M. ovogemata	29-46	3-6	24-29	6-8	338-516

Acknowledgements: To Dr. H.H. Kühlmann, ZMB, for the photograph and localization of the type material of *S. vesparium;* to Dr. George M. Davis, ANSP, for loaning type material of *S. vesparium;* to Miss Kathlenn Smith, USNM, for localization and photograph of type material of *S. vesparium;* to Miss Shirley M. Stone, BMNH, for loan and photograph of type material of *T. vesparioides;* to Dr. B. P. Haldar, The Zoological Survey of India, Calcutta, for localization of type material of *T. vesparioides;* to Dr. F.W. Rowe, AUSM, for loaning the holotype of *M. ovogemata;* to Dr. Francisco Kiss of Universidade Federal do Rio Grande do Sul, Porto Alegre, for the SEM photographs; to Miss Rejane Rosa , MCN, for the final art to the drawings. The senior author acknowledges the granting of fellowship nº 30.6134/76 of Conselho Nacional de Desenvolvimento Científico e Tecnológico, (CNPq.) Brazil.

REFERENCES

ANNANDALE, N. 1908. Notes on freshwater sponges IX, Preliminary notice of a collection from Burma with the description of a new species of *Tubella*. **Rec. Indian Mus.,** Calcutta, 2: 157-158.

ANNANDALE, N. 1911. Freshwater sponges, hydroids and polyzoa. **In: The Fauna of British India, including Ceylon and Burma.** London, Taylor & Francis, p. 1-126, 241-245.

__. 1918. Zoological results of a tour in the Far East. II: Freshwater sponges of Japan, China and the Malay Peninsula. **Mem. Asiat. Soc. Beng.,** Calcutta, **6:** 199-216.

GEE, N.G. 1929. Notes on the freswater sponges of the Dutch East Indies. I: Historical. **Treubia,** Buitenzorg, **11** (2): 297-300.

__.1930. Notes on the Freshwater sponges from the Dutch East Indies. II: Descriptions. **Treubia,** Buitenzorg, **12** (1): 67-114.

__. 1931. A contribution towards an alphabetical list of the known freshwater sponges. **Peking. nat. Hist. Bull.,** Peking, **5** (1): 31-52.

__. 1932. The known freshwater sponges. **Peking nat. Hist. Bull.**, Peking, **6** (3): 25-51.

__.1933. Freshwater sponges, genus Tubella. **Peking nat. Hist. Bull.,** Peking, **7:** 237-252.

MARTENS, E. von. 1868. Über einige Ostasiatische Süsswassertiere. **Arch. Naturgesch.**, Berlin, **334:** 61-64.

PENNEY, J.T. 1960. Distribution and bibliography (1892-1957) of the freshwater sponges. **Univ. S. Carol. Publs.,** Columbia. Ser. 3, **3** (1): 1-97

PENNEY, J.T. & RACEK, A.A. 1968. Comprehensive revision of a worldwide collection of freswater sponges (Porifera; Spongillidae). **Bull. U. S. natn. Mus.,** Washington, **272:** 1-184.

STANISIC, J. 1979. Freshwater sponges from the Northern Teritory (Porifera: Spongillidae). **Proc. Linn. Soc. N. S. W.** Sydney, 103 (2): 123-130.

VOLKMER-RIBEIRO, C. 1981. Porifera **In:** HURLBERT, S.H.; RODRIGUES, S. & SANTOS, N.D. 1981. **Aquatic Biota of Tropical South America.** pt. 2: Anarthropoda: 86-94.

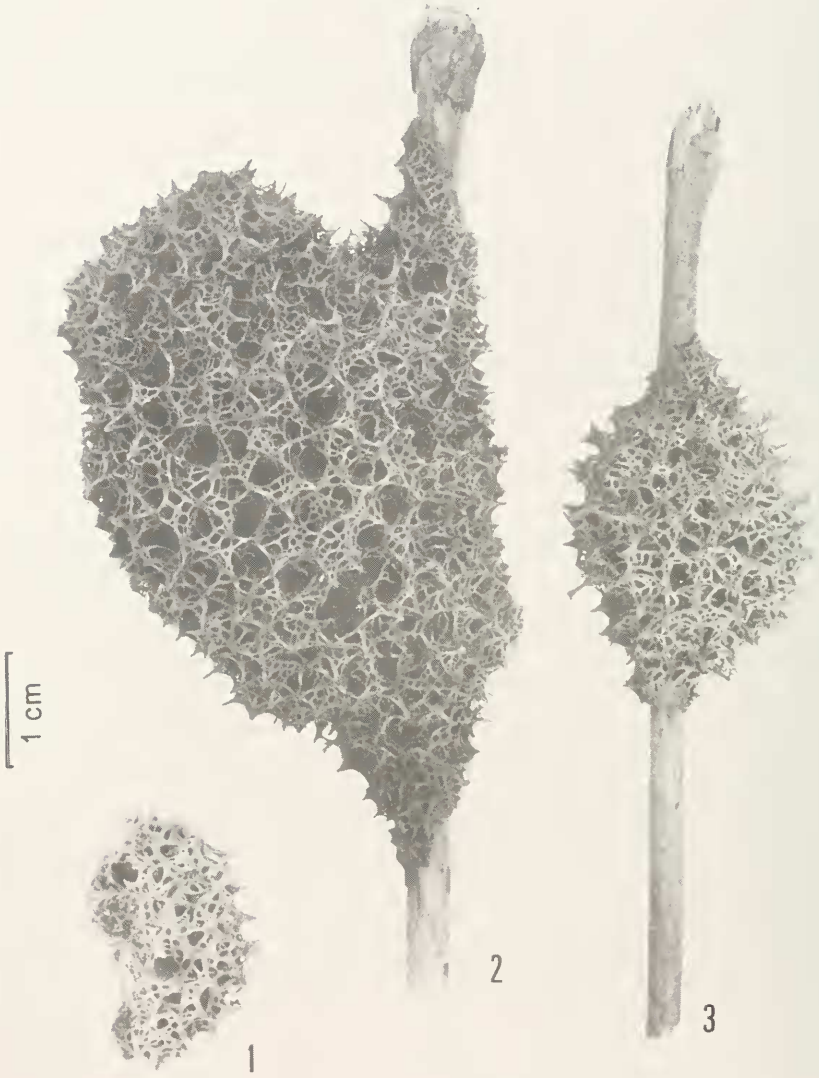
__.1986. Evolutionary study of the freshwater sponge genus *Metania* Gray, 1867: III. Metaniidae, new family. **Amazoniana.** Kiel, **4** (9): 493-509.

VOLKMER-RIBEIRO, C. (in press). The freshwater sponges in some Peat Bog Ponds in Brazil. **Amazoniana**, Kiel, **12** (2).

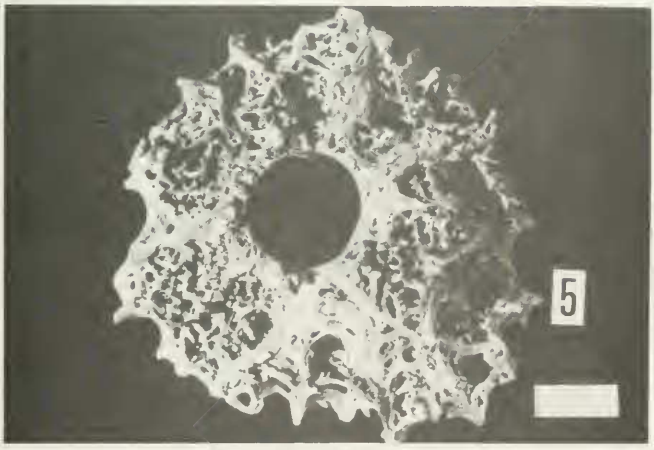
VOLKMER-RIBEIRO, C. & COSTA, P.R.C. 1992. On *Metania spinata* (Carter, 1881) and *Metania kiliani* sp. n.: Porifera, Metaniidae Volkmer-Ribeiro, 1986. **Amazoniana.** Kiel, **12** (1): 7-16.

WELTNER, W. 1895. Spongillidenstudien. III. Katalog und Verbreitung der bekannten Süsswasserschwamme. **Arch Naturgesch**. Berlin, **61**: 114-144.

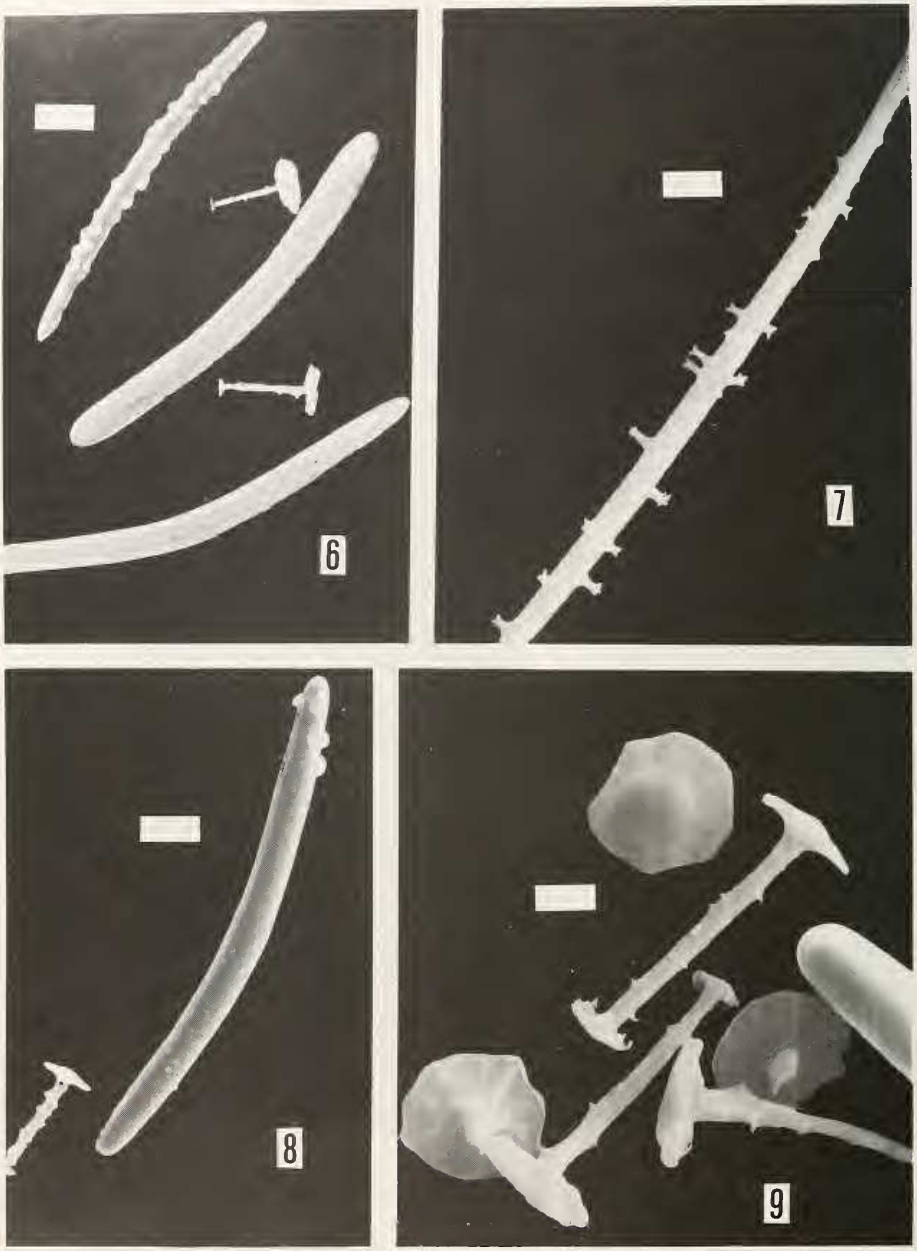
Recebido em 6.03.1992; aceito em 7.12.1992.



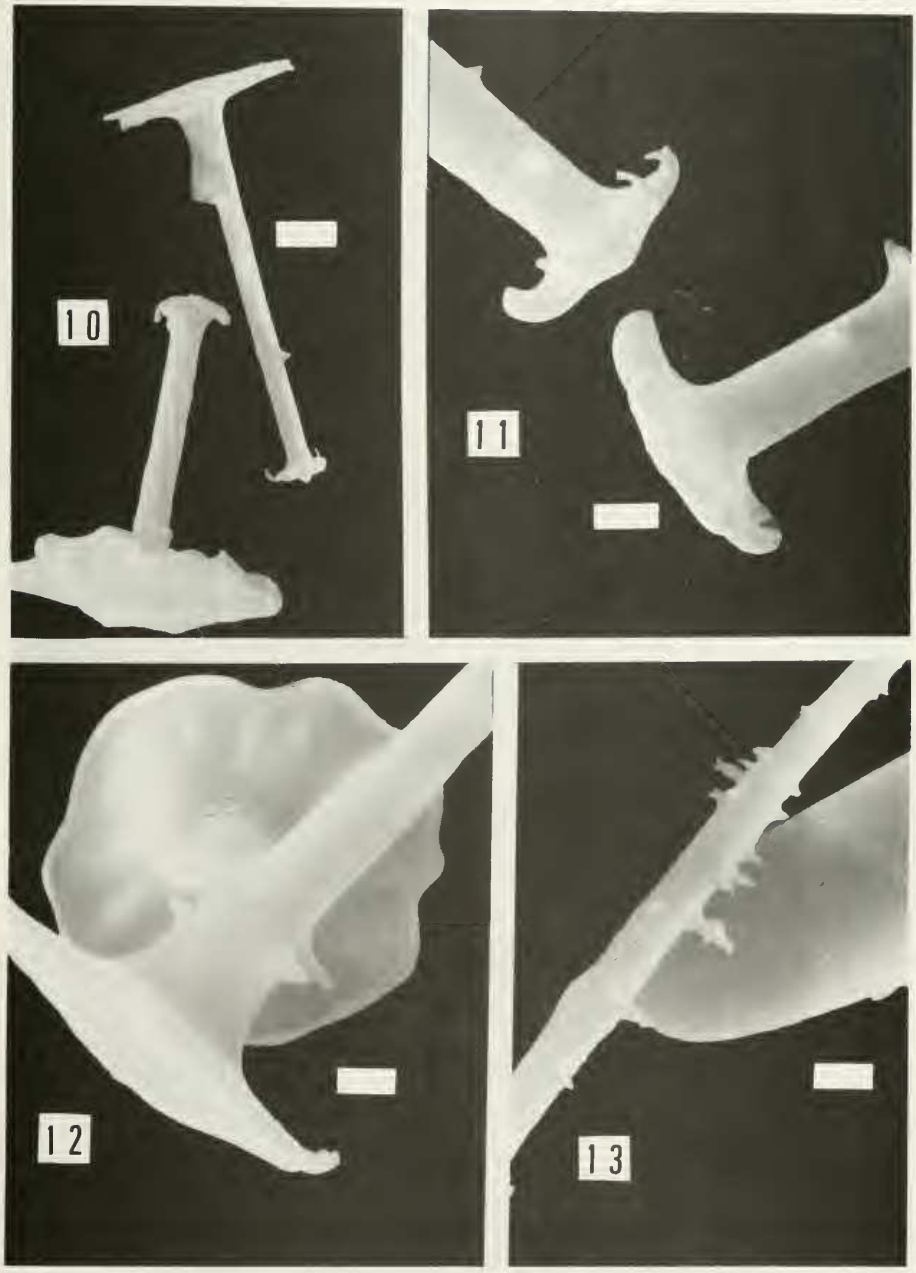
Figs. 1-3. *Metania vesparium* (Martens, 1868). 1. Lectotype, ZMB nº 248; 2. Paralectotype ZMB nº 12.602; 3. Paralectotype ZMB nº 12.603. (Photo V. Heinrich ZMB).



Figs. 4-5. *Metania vesparium* (Martens, 1868). 4. Part of lectotype USNM nº 21.521, scale = 1cm. (Photo USNM). 5. Part of lectotype ANSP. Scale = 0,6 mm. (Photo A. A. Lise, MCN).



Figs. 6-9. *Metania vesparium* (Martens, 1868). 6. Alfa megascleres, beta megascleres and gemmoscleres, scale= 30 µm; 7. Spines on microsclere, scale = 10 µm; 8. alfa megasclere and gemmosclere, scale= 30 µm; 9. gemmoscleres and outer and inner face of lower rotules, scale = 10 µm; (am. alfa megasclere, bm. beta megasclere, g. gemmosclere, ilr. inner face of lower rotule, olr. outer face of lower rotule).



Figs. 10-13. *Metania vesparium* (Martens, 1868). Gemmoscleres; 11. details of upper rotule of gemmoscleres; 12. inner face of lower rotule and details of the collar of spines on the shaft; 13. midle part of microsclere and extremity of alfa megasclere, scale= 6 µm.

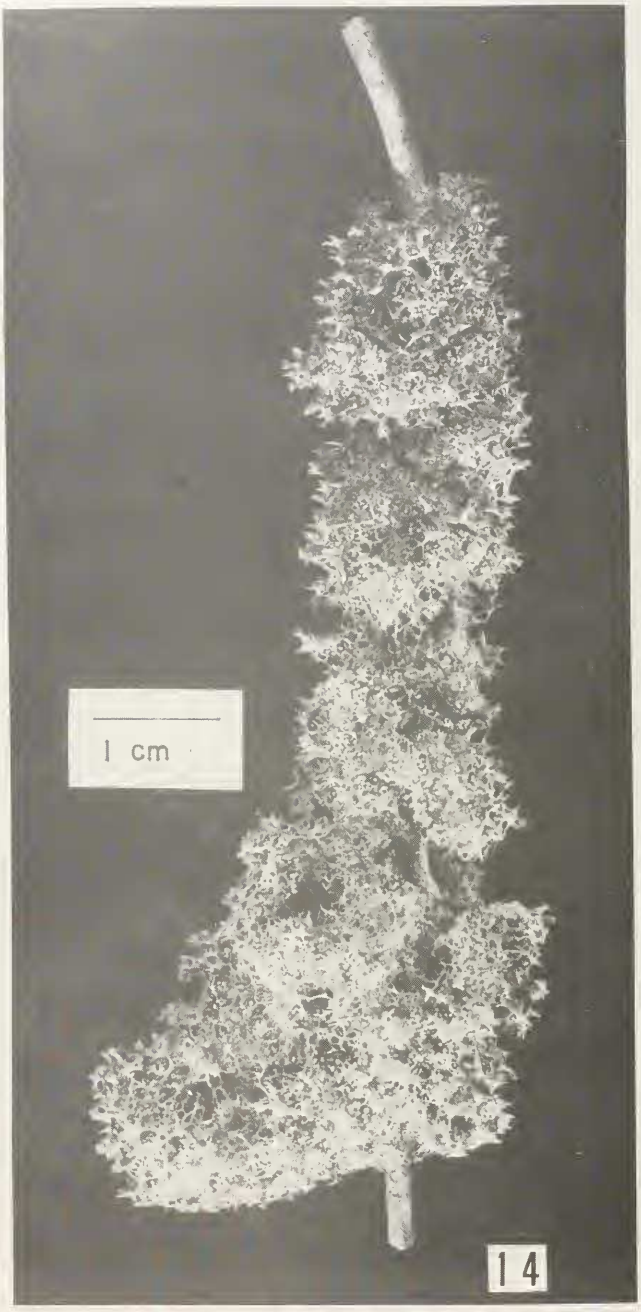
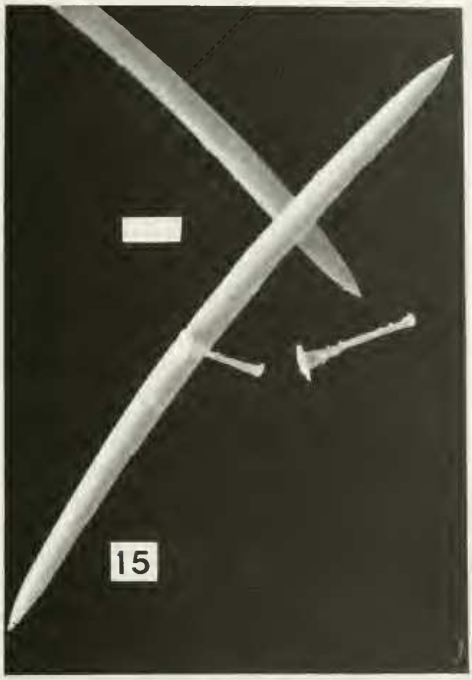
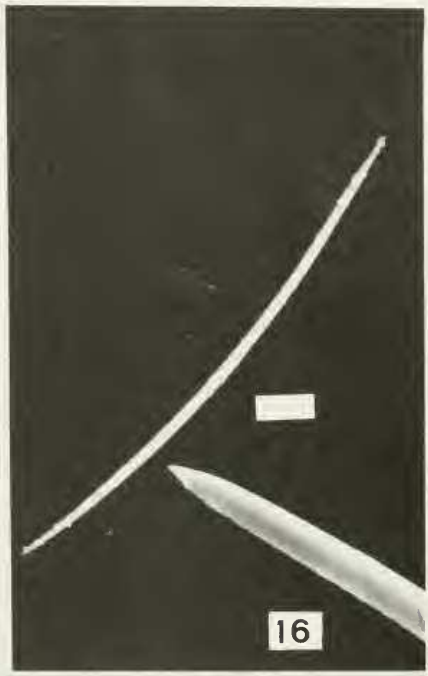
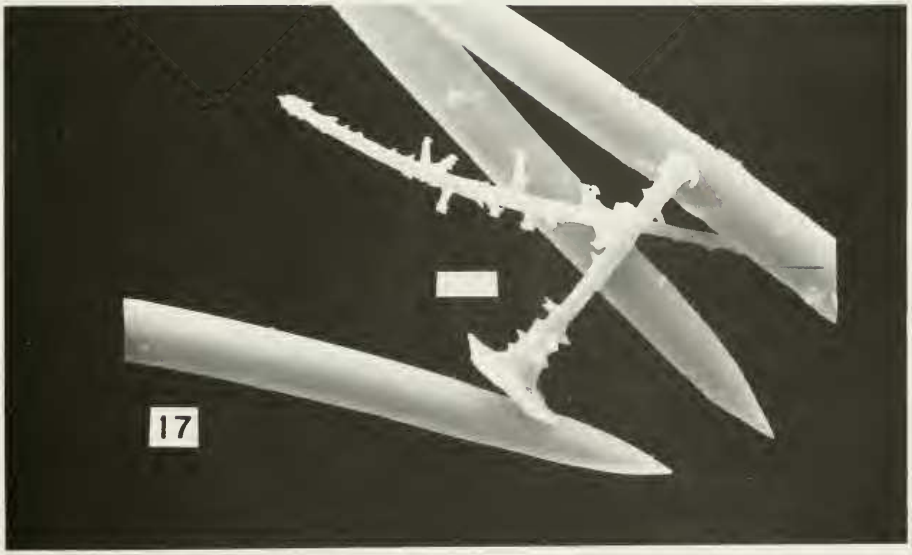


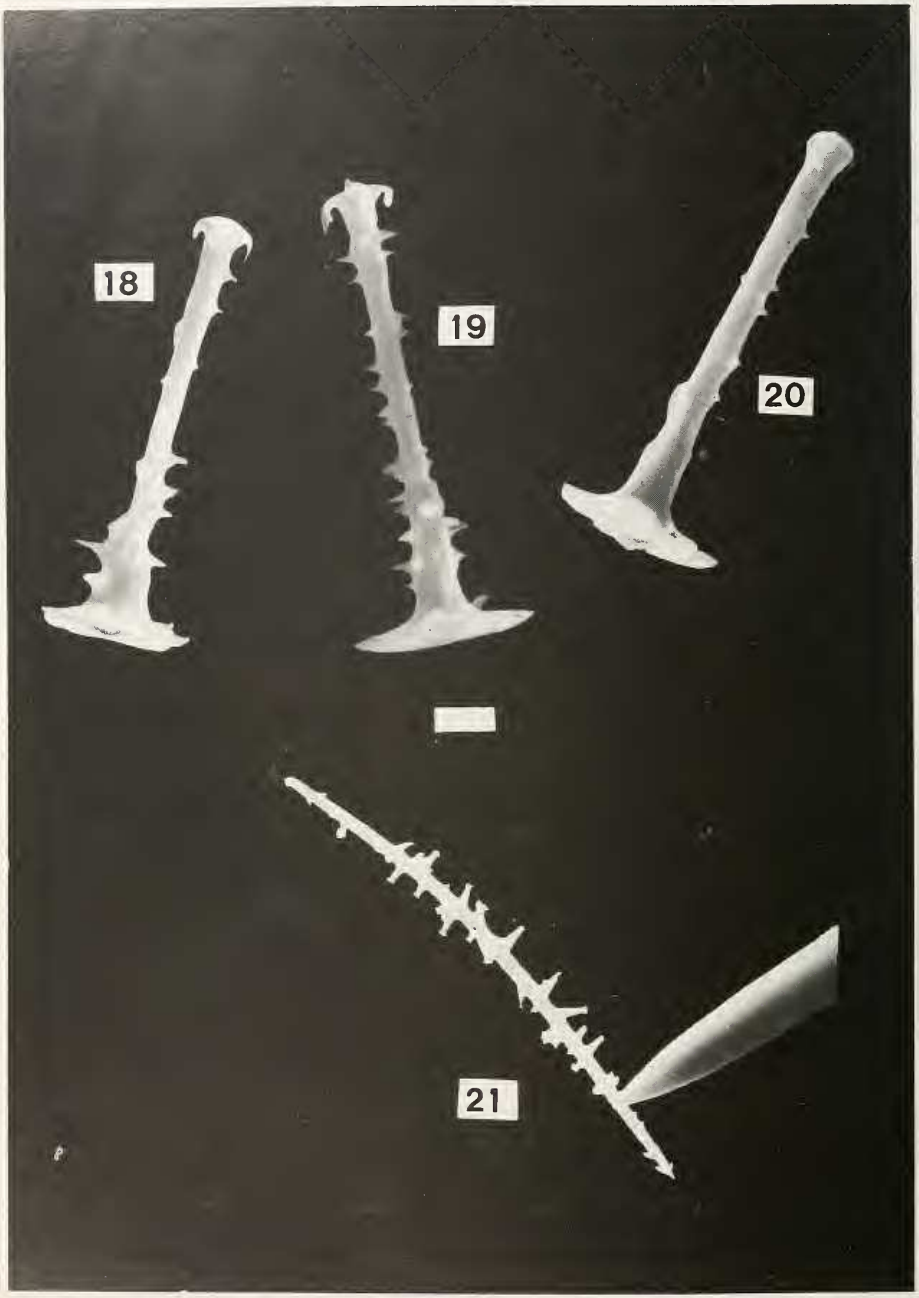
Fig. 14. *Metania vesparioides* (Annandale, 1908): Lectotype BMNH nº 1914: 11: 24:36. (Photo BMNH).







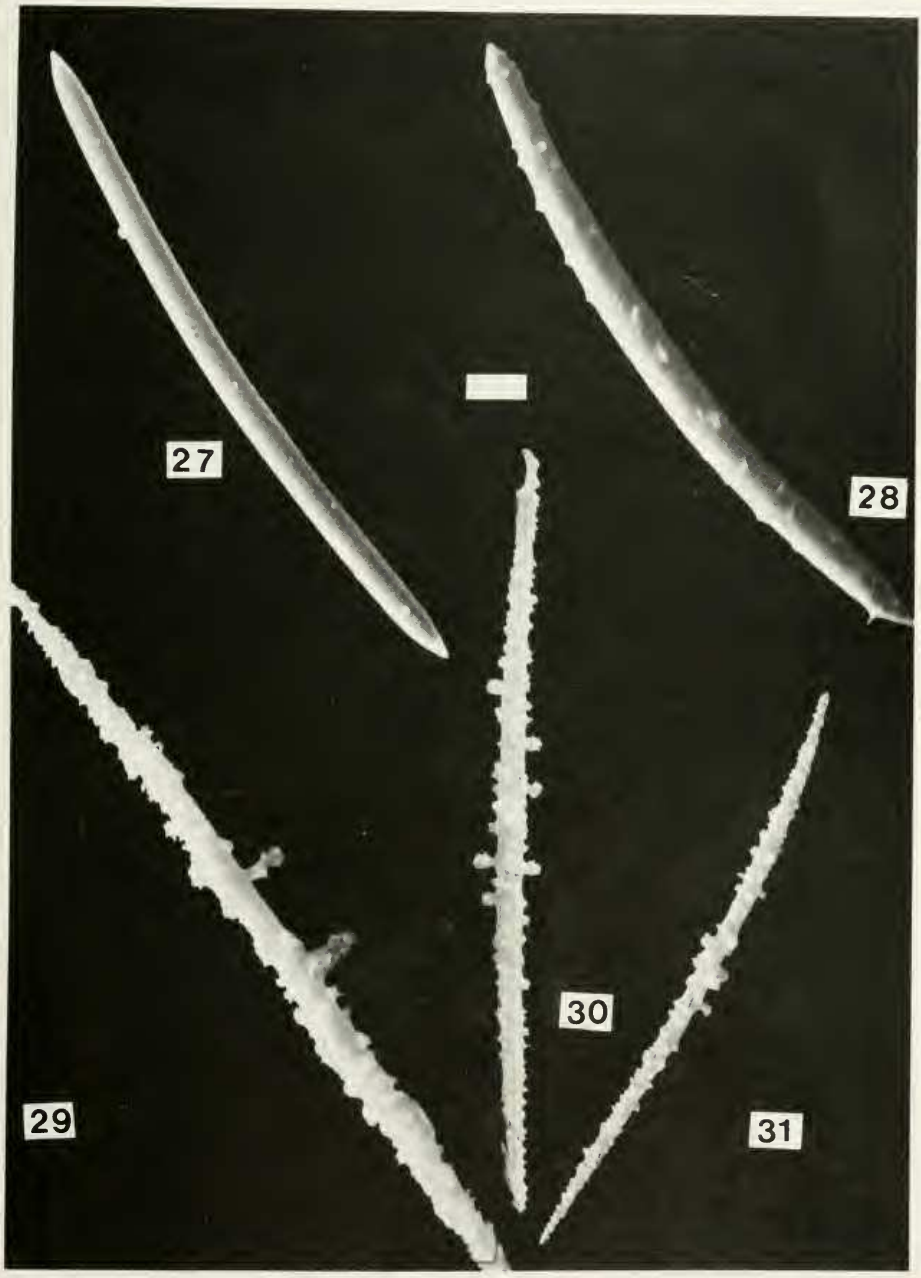
Figs. 15-17. *Metania vesparioides* (Annandale, 1908). 15. alfa megascleres and gemmoscleres, scale = 38μm; 16. beta megasclere and part of alfa megasclere, scale = 27μm; 17. alga megascleres; microsclere and gemmosclere, scale = 13 μm



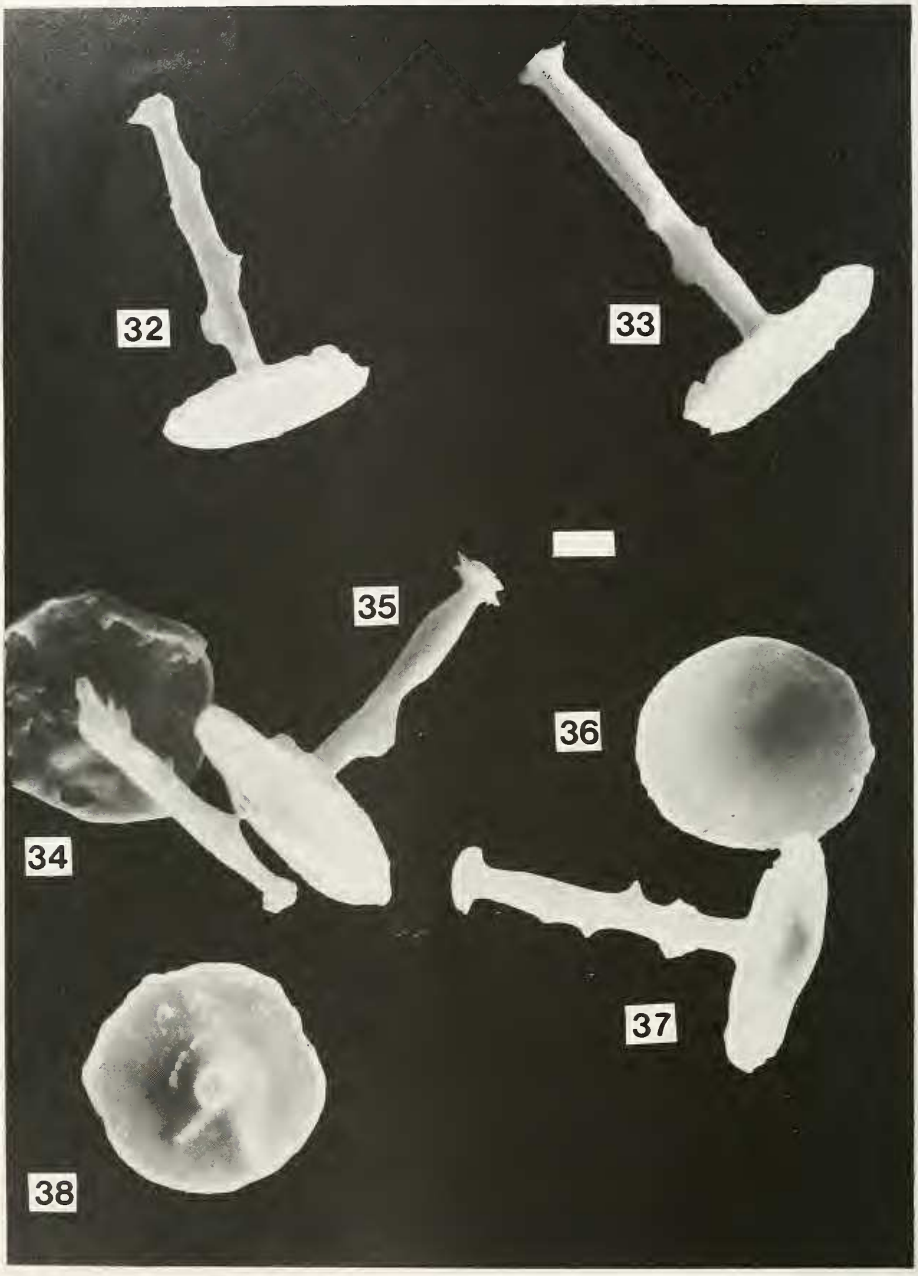
Figs. 18-21. *Metania vesparioides* (Annandale, 1908): 18, 19, 20. gemmoscleres; 21. microsclere, scale = 10 µm.

Figs. 22-24. *Metania vesparioides* (Annandale, 1908). 22. Details of the lower rotule of gemmosclere in fig. 17; 23. details of the microsclere in fig. 17; 24. details of upper rotule of the gemmosclere in fig. 17. Scale = 3µm.

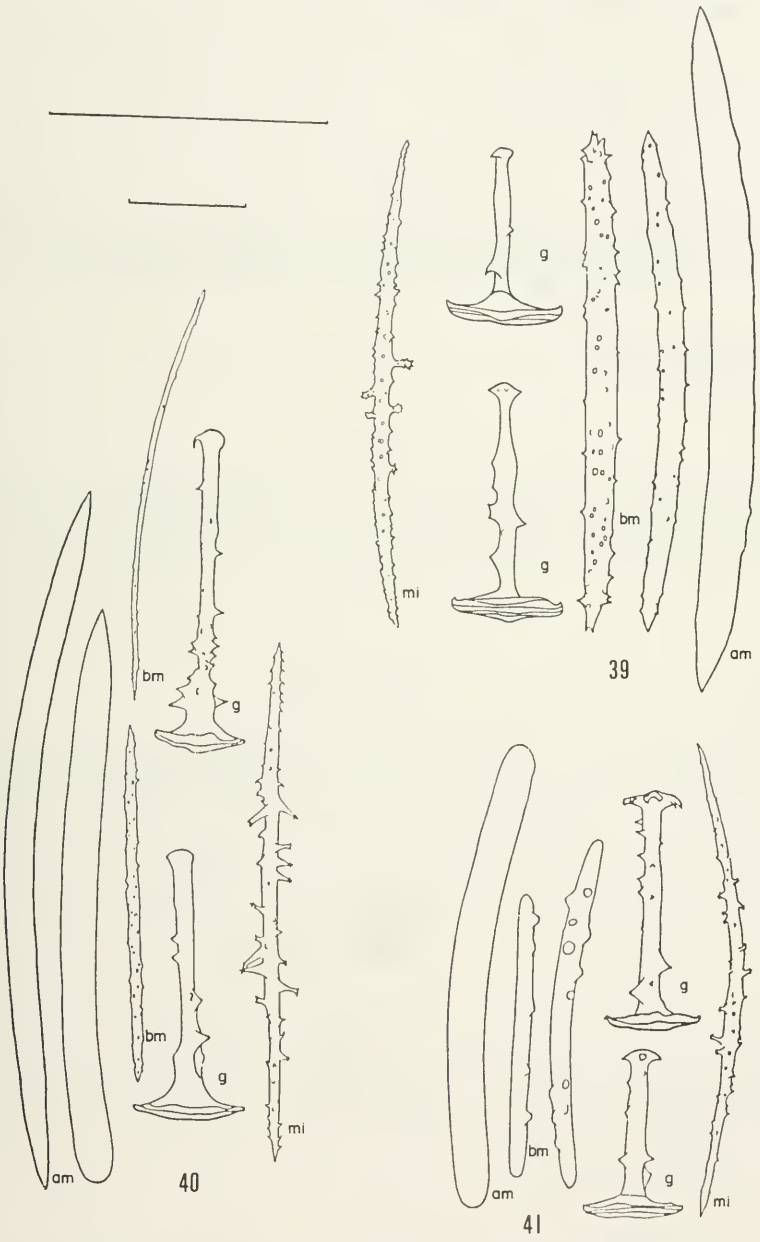
Figs. 25-26. *Metania ovogemata* Stanisic, 1979. 25. Photograph of holotype, scale = 7mm; 26. detail of the skeletal structure in the holotype, scale = 3,5 mm. (Photos A. A. Lise, MCN).



Figs. 27-31. *Metania ovogemata* Stanisic, 1979. 27. Alfa megasclere, scale = 30 µm; 28. beta megasclere, scale = 28µm; 29-31. microscleres, scale for figs. 29-30 = 8 µm; scale for fig. 31= 13µm.



Figs. 32-38. *Metania ovogemata* Stanisic, 1979: 32, 33, 35, 37. Gemmoscleres; 34, 38. inner face of lower rotules; 36. outer face of lower rotule, scale= 6 µm.



Figs. 39-41. Spicules: 39. *Metania ovogemata* Stanisic, 1979; 40. *M. vesparioides* (Annandale, 1908); 41. *M. vesparium* (Martens, 1868). am. alfa megasclere, bm. beta megasclere, g. gemmosclere, microsclere (the larger scale applies only to the gemmoscleres and microscleres; scales = 50 µm.